PROVINCE OF NOVA SCOTIA

Annual Report

OF THE

NOVA SCOTIA WATER RESOURCES COMMISSION

FOR THE YEAR ENDED

DECEMBER 31, 1971

QUEEN'S PRINTER
HALIFAX, N. S.

To His Honour,

The Honourable Victor deB. Oland, V.D.,

Lieutenant Governor of Nova Scotia.

May it please your Honour:

I have the honour to submit the Annual Report of the Nova Scotia Water Resources Commission for the year ending December 31, 1971.

I have the honour to be Sir,

Your most obedient servant,

G. M. Bagnell,
Minister under the Water Act.

Office of the Minister,
Halifax, N. S.
December 31, 1971.

101-03356/

ANNUAL REPORT OF THE

NOVA SCOTIA WATER RESOURCES COMMISSION

For the Year Ending 31 December, 1971

Honourable G. M. Bagnell,

Minister Under the Water Act,

Halifax, N. S.

Dear Sir:

I have the honour, sir, to submit the annual report of the Nova Scotia Water Resources Commission for the year ending December 31, 1971.

The scope of activities of the Water Resources Commission continued to show substantial increase during the year. Mainly this is attributed to the steadily growing public awareness of the problem and consequences of pollution. As part of the increased activity, a mobile workshop laboratory was commissioned for the purpose of inspecting and assisting in the operation of waste treatment facilities throughout the Province. The results are encouraging.

With regard to the municipal field, progress in pollution control and water treatment continues, but there are indications that the rate is slowing. This might be taken as an indication that the relatively simple problems have been solved and the more difficult remain. Quite possibly a revision of the course of action may be indicated.

Efforts to deal with industrial waste control are beginning to demonstrate encouraging results, and it is expected that with experience and training of staff, progress in this aspect may continue to approach a satisfactory state.

The operation of the Province-owned water supply utilities was acceptable. Regrettably, the changes in admininstration were delayed, but these proposals are contemplated for the next year.

Appointed Members

The Members of the Board of the Water Resources Commission are: E. L. L. Rowe, Chairman; Dr. J. E. Blanchard, Vice Chairman; Mr. Grant Bagnell, Member; Mr. Ferguson MacKay, Member and Mrs. E. L. Swift, Member.

The latter three persons named are new members having been appointed at the expiration of the terms of appointment of three members during December 1970.

Staff

The number of professionals on Staff remained constant during the past year. One engineer resigned in the Spring and was replaced by a recent graduate.

A technician was engaged to complete the organization for the waste treatment plant inspection section.

It was found necessary to add one additional member to the clerical staff to assist in modifying and improving the filing and recall system. Two resignations from the clerical staff were received and these persons were replaced in the usual way.

The present complement of staff includes nine professional engineers, three technicians and seven administrative and clerical employees. A further fifteen persons are engaged as temporary employees in the public service as operators in the field for the various utilities owned and operated by the Province.

Administration

The amount of routine administrative matters reaching the commission offices for action continues to show a very substantial increase. This is a matter of considerable concern because it detracts from the capacity of the organization to deal with planning and new problems. During the next year, it is anticipated that a critical review of procedures, an overhaul of the filing and retrieval system and the develop-

ment of a Provincial information agency may improve the speed and efficiency of this agency in processing these routine items.

During the year, an examination was made of the costs and implications to the Provincial treasury of pollution abatement for municipalities. This report was submitted for Government consideration during December. An additional examination was undertaken of industrial pollution control in the Province but because of the comparative scarcity of data, it is expected that this report will require a considerably greater length of time to prepare.

Five prosecutions were requested for violation of the Water Act and the Environmental Pollution Control Act and two convictions were secured. In addition, two orders were issued and compliance obtained without recourse to further action.

The policy of the Commission in seeking prosecution is to regard this sort of action as one of last resort. However, there is no doubt that as a technique for securing pollution control, the procedures and practices in the present circumstances leave much to be desired from the point of view of speed and efficiency. It is, therefore, imperative that these be modified.

In response to the very great number of requests for pollution information from students, a pollution kit was prepared and made available. In the supply of material and other assistance, acknowledgment is made to the Canada Department of the Environment and the Ontario Water Resources Commission for the assistance of these two organizations. These kits proved to be of very great assistance and the Commission believes the costs were well justified.

Members of the Commission and staff participated in seminars, courses and public appearances upon request during the year, partly as a public service, and partly for personnel devlopment. Regrettably, perhaps, the exigencies of time and money prevented an even greater scope of activity in this regard.

Water Supply

A total of 76 applications for water rights were received and considered during the year. All except two were recommended for

approval. These applications included requests for the use of watercourses for water supply such as that by the Public Service Commission of Halifax for Pockwock and Tomahawk Lakes, the alteration of watercourse for erosion control and requests for the maintenance of lake levels for recreational use and aesthetic reasons.

The dam at Timber Lake in Lunenburg County was put into operation in July of 1971. This dam was constructed to increase the amount of water available for the Anil Hardboard Plant at East Chester.

A rock barrier was constructed in Fletcher River at Wellington Station to temporarily effect the same water control features previously attributed to the old dam at the Fish Culture Station nearby. The station was abandoned in 1968 and the timber dam in this location has deteriorated considerably.

The water requirements for Riverport Seafoods was reviewed and, as a consequence, recommendations were made to develop Pernett's Lake to meet the increased demand.

A new set of charges for water as a resource was developed during 1971 and will come into effect mainly during 1972.

Pollution Control

Municipal

Although the number of Joint Certificates of Approval issued for sanitary and storm sewers and sewage treatment plants was approximately the same in 1971, the total worth of the projects was substantially less. In 1971 200 Joint Certificates of Approval were issued compared with 208 for the year 1970.

During the year, the Water Resources Commission advanced to municipalities $90,615.74 for pollution control studies. This compares with $201,535.34 advanced during the previous year. It should be noted, however, that the amount of money advanced in this way will decrease as pollution control studies are completed for municipalities. Indeed, by mid 1971, it was considered that very nearly all the municipalities of significant size had been studied.

The amount of money paid out in grants to municipalities for pollution control pursuant to the Regulations of the Water Act was $121,463.30 during 1971. The amount paid in the same way during 1970 was $286,204.76, indicating a substantial decrease in the total worth of pollution abatement projects undertaken.

A report estimating the capital and operating costs of sewage collection and treatment for municipalities in Nova Scotia was completed during the year. This report estimated that a total of $217,000,000 would be required to achieve municipal pollution abatement in all serviceable areas in the Province:

Some of the more notable municipal projects completed or under construction in 1971 are:

Project	Cost
Baddeck—Sewer System	$ 330,000.00
Bedford-Sackville—Sewer System	3,780,000.00
Bible Hill—Sewer System	294,000.00
Bridgetown—Sewer System	176,600.00
Bridgewater—Sewer System	792,000.00
Brookfield—Sewer System	352,500.00
Dartmouth—Wildwood Water System	297,000.00
Elmsdale—Water and Sewer System	500,000.00
Enfield—Sewer System	424,000.00
Greenwold—Water and Sewer Systems	133,400.00
Halifax—Lacewood Drive Sewers	968,500.00
Halifax—Kline Heights Sewers Phase I	1,159,000.00
Judique—Sewer System	104,000.00
Louisdale—Water and Sewer System	1,109,000.00
Middleton—Sewer System	340,000.00
Mulgrave—Water System	400,000.00
Sydney River—Sewer System	453,000.00
Westmount—Sewer System	360,000.00
Windsor—Sewer System	1,378,000.00

In 1971, the following pollution control studies were completed and submitted to the Nova Scotia Water Resources Commission. The cost of implementing the recommendations of the studies is shown:

Study	Cost
Antigonish County *	$2,217,000.00
Antigonish, Town of	1,082,000.00
Aylesford	405,000.00
Canning	249,000.00
Halifax County—Beechville to Timberlea	1,806,000.00
Eastern Passage	2,365,000.00
Hubbards	355,000.00
Musquodoboit	478,000.00
Preston, Humber Park	1,755,000.00
Sheet Harbour	756,000.00
Terence Bay, Brookside	623,000.00
Waverley, Fall River, Wellington Windsor Junction	1,196,000.00
Kentville	593,000.00
Liverpool	200,000.00
Pleasant Hill	497,000.00
Truro	1,902,000.00
West Hants	2,371,000.00
Wolfville	384,000.00
Yarmouth	1,193,000.00

* Fifteen communities were studied.

The following pollution control studies were initiated or partially carried out in 1971 and are scheduled for completion in 1972:

Annapolis County, Phase II
Barrington, Municipality of, Phase II
Cape Breton County, Phase II
Colchester County
Parrsboro

During 1971 a great number of field trips were made to insure that projects were being constructed according to the approved plan as well as to investigate alleged violations of the Water Act.

Industrial

The continuing efforts to achieve an effective pollution abatement program for industrial waste are beginning to demonstrate some significant progress. During the year, the activities may be described as

investigation and recommendation of applications for industrial waste facilities, an industrial waste survey, monitoring and investigation of industrial pollution and special projects.

There were 7 certificates issued during the year.

The industrial waste survey has been evolving slowly since early Spring to the present. There are approximately 600 industries in Nova Scotia of which about 100 can be considered as major with respect to pollution load. The details of these major industries effluent have been requested by 31 January, 1972. The response from 50 industries thus far has been poor and what information received has been incomplete for the most part. It is, therefore, likely that much more aggressive action will be required to develop the data and, quite possibly, this information may be only obtained through investigations by Staff in the field.

Monitoring and investigation has mainly taken the form of spot tests in response to reports from municipalities, Canada Department of the Environment, Fisheries Service, other agencies and individuals.

Some of the problems investigated and, for that matter, some which are currently under investigation are:

Acadian Distillers Limited, Bridgetown—This company is experiencing difficulties in meeting the requirements of the Water Resources Commission for the satisfactory disposal of molasses stillage. Disposal by spraying on pasture land was attempted in one location and subsequently had to be abandoned because of excessive kill of the cover crop and resulting runoff to a nearby watercourse. Further, similar attempts have been made in other locations with the same effects but to a lesser degree. This problem is now currently under investigation by consultants engaged by the company.

Enamel and Heating Products Limited, Amherst—An oil spill of significant magnitude occurred last Spring at this plant and polluted a watercourse known as Dickie Brook. Because the clean-up operations were swift and effective, there was no apparent damage to the ecology.

A facility was developed in consultation with the Water Resources Commission for preventing future oil spills of this type, and the company's application for license was subsequently approved.

Buckingham Mills Limited, Springhill—During the Fall of 1970, this company installed dyeing facilities without approval of the effluent discharge. As a consequence of this operation, an occasion of pollution occurred in River Philip.

The company was ordered to stop the discharge of the polluting effluent and, as a consequence, a treatment facility was installed and subsequently approved. In addition, however, there is development work going forward to increase the efficiency of these works.

Karl Karlsen Whale and Seal Processing Plant, New Harbour—The effluent from this process continues to cause an occasion of pollution in the nearby watercourses and to the atmosphere. The problem of abating this type of pollution is very difficult, and the company is in consultation with the Water Resources Commission to work out a satisfactory design.

Imperial Oil Limited, Dartmouth—At times of heavy precipitation there is a discharge of oil from the ballast water treating facility to the harbour. The Commission is concerned, at the present time, that these facilities be upgraded so as to preclude such an occasion of pollution. The company has been advised of the Commission's requirements, and it is expected that a favourable response will be made in the near future.

Canso Chemicals Limited, Abercrombie Point—In compliance with directives from the Water Resources Commission, the company has installed a refrigeration unit followed by an activated carbon filter to remove mercury from the hydrogen waste stream. In addition, fumes from the caustic storage tanks are likewise directed through activated carbon filters. The latest tests demonstrated that these measures have minimized discharge of mercury to the environment to the extent that technology allows.

Since commencing operation, this company has been discharging all aqueous streams which could contain mercury to total retention ponds having impervious linings. Obviously, such facilities can only be temporary to allow the development of processes for the removal of mercury by chemical means. The Commission has been advised that a pilot installation has been completed and will commence trials in the near future. The Commission will require details of operating performances before recommending approval.

Michelin Tire Company of Canada Limited, Granton—This company has been granted approval for its industrial waste treatment facilities for a period of one year during which time the effluent discharging to the Middle River reservoir will be evaluated and assessed.

Scott Maritimes Pulp Limited, Abercrombie—The in-plant improvements for solids recovery and pH control have been reviewed, and the application for a permit has been recommended for approval.

Boat Harbour Waste Treatment Facilities—The conceptual design and some of the detailed engineering has been developed for modifying the Boat Harbour facilities and some of the related construction work has been started.

Nova Scotia Pulp Limited, Port Hawkesbury—The primary treatment facilities for the removal of solids in the effluent from this plant has been approved but final approval of the total facilities is pending the development of a secondary treatment system. The Water Resources Commission approved the installation of a pilot plant employing the so-called Unox System, and this facility is scheduled to commence operation on or about 15 January 1972. The purpose of this pilot unit is to develop paramaters for the design of a full-scale plant to provide secondary treatment of the waste.

Kaiser Celestite Mining Company Limited, Lake Enon—The waste treatment facilities for the mine at Lake Enon, consisting of a series of settling ponds, was approved early in the year. There have been some modifications and changes, but essentially, the process is one of total re-circulation of water under ordinary operating conditions throughout the plant. There are, however, occasional discharges of waste water but only after the passage through three settling ponds. Very recently there has been some concern about the concentration of heavy metals in this water, but thus far, these concentrations have not exceeded critical levels.

Kaiser Aluminum and Chemical Company Limited, Point Edward—The application for approval of industrial waste facilities for this plant is about to be processed pending an investigation of the installation.

Anil Canada Limited, East River, Chester—The proper treatment of waste from this company has been of long-standing concern to the Commission. Following a study conducted by consultants engaged by the company, a program has been drafted whereby this company must achieve satisfactory pollution control by the Summer of 1972. In the meantime, certain measures will be carried out during the Winter months to improve the efficiency of the existing facilities. These measures are, however, pre" ·ary and are not part of the additional works required to secure t ·oper abatement of pollution.

Michelin Tire Company of Canada Limited, Bridgewater—The waste treatment facilities designed and installed for this plant were granted approval during the year. Some operational difficulties have been encountered, but these problems would seem to have been solved.

Agriculture - Pig Farms—A problem of rather significant proportions has been identified in connection with the disposal of waste from this type of operation. The conventional solution to the disposal and treatment of this waste is expensive and some research is, at present, underway to identify less expensive techniques. This problem is, of course, complicated by the depressed state of the market for pork.

Inspection Services

The mobile workshop laboratory was put into operation on 14 September 1971. Since that time and up until the end of 1971, the inspection staff examined the operation of 46 sewage treatment plants in a total of 72 individual inspections. This means, of course, that some treatment plants were visited two or more times.

Of the 46 treatment plants inspected, 15 had operational problems as identified by the facilities of the mobile laboratory.

A considerable amount of the inspection staff time was employed in the instruction of operators, in basic maintenance procedures and operation. It is expected, however, that in time the requirements for training of this nature will diminish, but it does point out a need for a training program for operators for treatment plant systems.

Based on the type and amount of work experienced, it is estimated that it would take approximately 18 months to make one complete cir-

cuit of the existing treatment facilities in the Province. The original intent of this present facility was to develop a suitable design and, at the same time, investigate the need and use for such a unit. It is the Commission's intention to request additional units over a period of years, the design and operation of each to be based on experience. The ultimate number of these units will depend upon the number of treatment plants and the number of times that we find these plants must be examined as well as the efficiency which can be achieved. In this latter regard, and by way of an example, the present arrangement is a truck-trailer type with a crew consisting of a professional engineer and a technician. The choice of such a design was based on the advantage of mobility in operating from one point. It may well be that experience will show that mobility thus obtained is not as valuable as other features such as space which was sacrificed.

Utility Operation

Water consumption at the various water supply facilities, operated under the jurisdiction of the Water Resources Commission, totalled approximately thirteen billion gallons for the year. The following table indicates the water consumption at each system for the period:

Water Supply System	Total Water Consumption 1971 in Millions of Gallons
Middle East Pubnico	11.4
Lockeport (Sea Water)	88.6
Riverport	29.0
East River Chester	552.3
Pictou	8,760.0
Canso	70.3
Strait of Canso (Point Tupper)	3,529.0
Cheticamp	35.0
Grand Etang (Sea Water)	3.0
Total	13,078.6

An additional vertical turbine pump and a smaller submersible pump were installed at the Middle River pumping station to provide a continuous supply of raw water to the new Michelin Tire plant at Granton, Pictou County. The pumps and associated controls and

pipelines were commissioned in October and were operating at design capacity near the end of the year.

The daily water demand at the Landrie Lake pumping station, Point Tupper neared design capacity with the start up of the Gulf Oil Refinery and the Town of Port Hawkesbury water treatment plant. Other customers being served by the water system include the C.G.E. Heavy Water Plant, the Nova Scotia Power Commission Thermal Plant, and Nova Scotia Pulp Limited.

One Senior Utility Technician was added to the operating staff at the beginning of the period, in order to provide field supervision and inspection of the various systems in the South Shore area. A formal training program was also continued during the year, with operating personnel attending specialized courses sponsored by the Ontario Water Resources Commission at Toronto.

This report may not be concluded without acknowledgment and appreciation of the cooperation and assistance received by the Commission from Federal, Provincial and Municipal agencies as well as the many other organizations and individuals outside Government service.

Respectfully submitted,

E. L. L. Rowe,
Chairman.